

Improvements Availability Phosphorus (P) On Acid Soil Through Utilization Of Phosphorus (P) Solubilizing Microbial And Organic Matter

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ABSTRACT

Phosphorus (P) as an essential nutrients has lower availability on acid soils because it has been fixation by Al, Fe and Mn element. To increase the availability of P in acid soils, it can be used phosphate rock (BF), organic matter and Phosphate Solubilizing Microbial (MPF). The purpose of this research is testing the MPF ability to dissolve BF at different levels fineness on pikovskaya liquid media and to study the effect of MPF combined with various compositions of compost to increase the availability of P in acid soils. There are two combination to dissolve BF in 60, 120 and 230 mesh on pikovskaya liquid media. The first combination is AB (*Aspergillus* sp. and *Bacillus* sp.) and the second is ABP (*Aspergillus* sp., *Bacillus* sp. and *Pseudomonas* sp.). Dissolved P is defined by Murphy and Riley method. There are two test for P availability in acid soil with pot; 1) using zeolite 5% with four treatment; there are a) BF with MPF combined with rice straw compost 100% (KJ), b) rice straw compost 75% + Gliricidia compost 25% (KJG), c) BF with MPF combined with rice straw 75% + cow manure 25% with zeolite 5% (KJS), d) BF with MPF combined with rice straw compost 75% + 12.5% Gliricidia compost + cow dung 12.5% (KJGS), and 2) not using zeolite but with same treatment as the point one. Availability P determined by Bray II method. The result showed that P solubility in BF 230 mesh on pikovskaya liquid media with ABP increasing 105.29% while with AB only 80.30% comparing to controls. BF fineness of 230 mesh increasing the solubility of P is better than the other sizes. ABP combination with a fineness of 230 mesh BF improve the solubility of P 120.39% comparing to controls. MPF treatment increases the availability of P₂O₅ 10.25% - 38%, while the compost treatment was 17.12% - 27.79%. Utilization ABP with BF (230 mesh) produce the highest P soluble in liquid pikovskaya media. The best availability of P in acid soils was on a combination of compost KJS + zeolite 5% with MPF1 (48, 64%).

Keywords: Rock phosphate, compost, phosphorus solubilizing microbial, pikovskaya, acid soil.